

**Large photoinduced refractive index changes in pulsed laser deposited Lead germanate glass waveguides with controllable refractive index sign change.**

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**Abstract**

A study of the photosensitivity of lead germanate glasses grown by pulsed laser deposition is presented. Lead germanate films were grown from stoichiometric bulk targets, on borosilicate glass substrates in an oxygen atmosphere, to form optical waveguides [1]. The films grown exhibited high absorption in the ultra violet spectral area (around 240 nm) which indicated the possibility of high photosensitivity.

The photosensitivity of the materials was examined by phase mask and interferometric grating recording over a wide ultra violet spectral region (325nm-193nm) using various continuous and pulsed laser sources. Very high refractive index changes (up to 1%) have been observed along with variable sign of the refractive index change depending on the oxygen background pressure used during growth and recording intensity.

1. S. Mailis, C. Riziotis, J. Wang, E. Taylor, A. A. Anderson, S. J. Barrington, H. N. Rutt, R. W. Eason, N. A. Vainos, C. Grivas, *Opt. Mat.* **12**, 27(1999)

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